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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/431,996	11/02/1999	KRISHNA BALACHANDRAN	BAL-7/LUC-11	9491

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PATTI & BRILL
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EXAMINER

AHN, SAM K

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/431,996

Applicant(s)

BALACHANDRAN ET AL.

Examiner

Sam K. Ahn

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment, received on 2/4/04.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4, 6, 7, 10-12, 15, 16, 18-31, 33-40, 42 and 44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4, 6, 7, 10, 11, 23, 24, 33-40 and 42 is/are rejected.
- 7) ☒ Claim(s) 12, 15, 16, 18-22, 25-31 and 44 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 4,6,7,10-12,15,16,18-31,33-40,42 and 44 have been considered but are moot in view of the new ground(s) of rejection.

Regarding newly amended claims 6, 23 and 42 where the added limitation of *replacing a portion of the transmission unit with extended header information*, which was previously noted as being allowable, is taught by a new reference by Furuskar.

Claim Objections

2. Claims 4, 6, 7, 10-12, 15, 16, 18-22 and 25-31 are objected to because of the following informalities:

In claim 6, line 11, delete "block" and insert "blocks".

In claim 12, lines 12-13, delete the two lines, which repeats already recited elements in lines 8-9 of the claim.

In claim 18, line 13, the Office suggests replacing "approximately one of 6, 12 and 18" with "one of 6, 12 and 18", since the number of transmission units are integers, it would not be required to approximate the number, otherwise, Schramm's teaching of having four units could be interpreted as having approximately six. Claims 15, 16, 19-22 and 25-31 directly or indirectly depend on claim 18.

Claims 4, 7, 10 and 11 directly depend on claim 6.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 4, 6, 7, 10, 11, 23, 24, 33-40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schramm (previously cited) in view of Roobol (previously cited), ⁱⁿ further _{view} of Furuskar et al. (Furuskar).

Regarding claims 6, 23 and 42, Schramm teaches a wireless communication system (21 of Fig.3) being capable of supporting link adaptation. Link adaptation is defined as described by the applicant on page 3, lines 6-7 as the dynamic selection of modulation and coding schemes based on radio link quality. Schramm discloses, in the abstract, a communication system supporting multiple modulations and supporting the schemes depending on the quality of connection. The system comprising a transmitter (20 of Fig.3) for forming fixed length radio link control (RLC) blocks (Fig.2), for forming fixed length coded sub-blocks (bursts in Fig.3) from the RLC blocks, and for configuring the coded sub-blocks into transmission units being capable of supporting link adaptation at multiple code rates. (note col.11 – col.12) Schramm further teaches retransmitting at least one of the RLC blocks at a code rate which may be different from the code rate used for an initial transmission of the at least one of the RLC blocks. (note col.11 – col.12)

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Schramm further teaches a receiver (a mobile station, 12 of Fig.3) receiving the transmission units (sent by the base station). The receiver includes a decoder for decoding the RLC blocks from the received transmission units as it is transmitted in an encoded RLC blocks (note col.6, lines 60-67).

Schramm also teaches wherein the adaptive rate transmitter transmits only a portion of a transmission unit comprising the at least one RLC block and integer number of the coded sub-blocks (note col.8, lines 12-23), wherein fewer information bits are contained in the RLC blocks, therefore may be dropping from the block or dropping one of the sub-blocks.

However, Schramm does not explicitly teach forming a downlink segment from the transmission units, for interleaving the downlink segment into an interleaved downlink segment, and for transmitting the interleaved downlink segment. Roobol teaches newly added features. Roobol teaches forming a downlink segment from the transmission units (output of 70 in Fig.3 including LCH of 40a and 40b), interleaving the downlink segment into an interleaved downlink segment (105) and transmitting the interleaved downlink segment (PDCH). (note col.3, line 51- col.4, line 20) Therefore, it would have been obvious to one skilled in the art at the time of invention to modify Schramm's teaching by including the steps above of Roobol, same assignee, for the purpose of adding flexibility as different number of LCH (2 or 3) may be combined into a downlink segment and enable efficient management of various service mixes, as taught by Roobol. (note col.4, lines 20-38)

Although Schramm teaches that during retransmission, a new header is formed, Schramm in view of Roobol do not explicitly teach wherein the adaptive rate transmitter replaces a portion of the transmission unit with extended header information. Furuskar teaches, in the same field of endeavor, retransmission of bursts when failure of burst transmission occurs initially. Furuskar teaches that in order to improve the probability of receiving the header of each burst during retransmission, implementation of different coding method, including its own Frame Check Sequence (FCS) are suggested. (note col.6, lines 25-44) It is inherent that by implementing these methods the length of the header will be extended. Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Schramm's teaching of header information during retransmission by implementing a more robust method in the header information, which would extend the length of the header information, for the purpose of increasing the likelihood of the header information being received by the receiver.

Regarding claim 4, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 6. And Schramm further teaches retransmitting at least one of the RLC blocks at a code rate which may be different from the code rate used for an initial transmission of the at least one of the RLC blocks. (note col.11 – col.12)

Regarding claims 7 and 24, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 6 or 23. Further Schramm teaches during

retransmission, a set of new number of bursts are produced. (see Fig.4b) Therefore, it is inherent that during retransmission, sub-block have not been transmitted previously.

Regarding claim 10, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 6. Schramm further teaches the transmitter adding block check sequence (BCS) (see RLC block in Fig. 4(a)) in order to check for errors in the information field. And further, by using the cyclic redundancy checking technique, the receiver evaluates the received RLC block. (col.3, lines 5-30)

Regarding claim 11, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 6. Schramm further teaches an adaptive rate transmitter forming coded sub-blocks (or bursts) by dividing into at least two to, which is dividing by variable value of 2.

Regarding claim 33, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 42. Schramm further teaches performing convolutional coding (note col. 2, lines 55 – col.3, lines 4) on the RLC blocks to generate encoded RLC blocks.

Regarding claim 34, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 33. Schramm further discloses the limitation of

performing convolutional coding with code rate of 1/3. (note col. 2, lines 55 – col.3, lines 4)

Regarding claim 35, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 33. Schramm also further discloses the limitation of step of interleaving the encoded RLC blocks. (note col.3, lines 5-23)

Regarding claim 36, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 35. Schramm teaches and shows segmentation of encoded RLC blocks into sub-blocks. Then, the groups of the coded sub-blocks (or bursts) are assembled to form the transmission units. (see Fig.4(a))

Regarding claim 37, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 36. Schramm teaches transmission units sent over GSM bursts.(note col.1, lines 20-37)

Regarding claim 38, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 36. And further, Schramm teaches configuring step of forming at least two of the transmission units of a different number of coded sub-blocks. Fig.4(a) has 4 sub-blocks, while Fig.4(b) displays 8 sub-blocks transmitting in different code rate.

Regarding claim 39, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 38. Schramm further discloses transmission of modulation using phase shift keying (PSK) as QPSK belongs to the same family of PSK. (see Fig.4(b))

Regarding claim 40, Schramm in view of Roobol and Furuskar teach all subject matter as applied to claim 38. Schramm further discloses transmission of modulation using gaussian minimum shift keying (GMSK) as one of common modulation type. (note col.1, lines 20-36)

Allowable Subject Matter

4. Claims 12 and 18 would be allowable if rewritten or amended to overcome the claim objection, set forth in this Office action.
5. Claims 15, 16, 19-22 and 25-31 would be allowable if rewritten to overcome the claim objection, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
6. The following is a statement of reasons for the indication of allowable subject matter:
Present application discloses wireless communication system capable of supporting link adaptation wherein the transmitter comprises forming RLC block capable of supporting link adaptation at multiple code rates. Closest prior art, Schramm et al. teach all the subject matter claimed, however, Schramm do not teach wherein the RLC blocks are divided by a value of 6, 12 and 18. And further, Schramm nor

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Furuskar teach wherein during retransmission, extended header information replaced with the dropped sub-blocks is provided with a sequence number.

Therefore, prior art do not teach or suggest all the limitation claimed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Sam Ahn** whose telephone number is **(703) 305-0754**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Stephen Chin**, can be reached at **(703) 305-4714**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

P.O. Box 1450

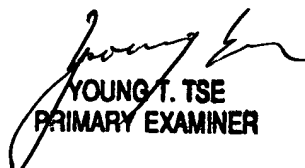
Alexandria, VA 22313-1450

or faxed to:

(703) 872-9306

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.


YOUNG T. TSE
PRIMARY EXAMINER

Sam K. Ahn
3/14/04